

WHAT IS CLAIMED IS:

1. A three-terminal filter using the area flexural vibration mode comprising:

- at least three electrodes having a substantially square shape; and
- at least two piezoelectric layers having a substantially square shape;

wherein

said at least three electrodes and said at least two piezoelectric layers are alternately laminated;

said at least two piezoelectric layers are polarized in a thickness direction;

and

said at least three electrodes include a first surface electrode located at a first surface of said filter that functions as an input electrode, a second surface electrode located at a second surface of said filter that functions as an output electrode, and an internal electrode located between said at least two piezoelectric layers that functions as a ground electrode.

2. The three-terminal filter according to claim 1, wherein said at least two piezoelectric layers are polarized in the same direction.

3. The three-terminal filter according to claim 1, wherein one of said at least two piezoelectric layers is polarized in a first direction, and another of said at least two piezoelectric layers is polarized in a direction opposite to the first direction.

4. The three-terminal filter according to claim 1, wherein one of said at least two piezoelectric layers is polarized in a direction extending from said first surface towards said internal electrode, and another of said at least two piezoelectric layers is polarized in a direction extending from said second surface towards said internal electrode.

5. The three-terminal filter according to claim 1, wherein one of said at least two piezoelectric layers is polarized in a direction extending from said internal electrode toward said first surface, and another of said at least two piezoelectric layers is polarized in a direction extending from said internal electrode toward said second surface.

6. A three-terminal filter comprising:
at least three electrodes; and
at least two piezoelectric layers; wherein
said at least three electrodes and said at least two piezoelectric layers are alternately laminated;
said at least two piezoelectric layers are polarized in a thickness direction;
and
said at least three electrodes and said at least two piezoelectric layers are configured to vibrate in an area flexural mode.

7. The three-terminal filter according to claim 6, wherein said at least three electrodes have a substantially square shape.

8. The three-terminal filter according to claim 6, wherein said at least two piezoelectric layers have a substantially square shape.

9. The three-terminal filter according to claim 6, wherein said at least three electrodes include a first surface electrode located at a first surface of said filter that functions as an input electrode, a second surface electrode located at a second surface of said filter that functions as an output electrode, and an internal electrode located between said at least two piezoelectric layers that functions as a ground electrode.

10. The three-terminal filter according to claim 6, wherein said at least two piezoelectric layers are polarized in the same direction.

11. The three-terminal filter according to claim 6, wherein one of said at least two piezoelectric layers is polarized in a first direction, and another of said at least two piezoelectric layers is polarized in a direction opposite to the first direction.

12. The three-terminal filter according to claim 6, wherein one of said at least two piezoelectric layers is polarized in a direction extending from said first surface towards said internal electrode, and another of said at least two piezoelectric layers is polarized in a direction extending from said second surface towards said internal electrode.

13. The three-terminal filter according to claim 6, wherein one of said at least two piezoelectric layers is polarized in a direction extending from said internal electrode toward said first surface, and another of said at least two piezoelectric layers is polarized in a direction extending from said internal electrode toward said second surface.

14. A filter comprising:
a plurality of electrodes; and
a plurality of piezoelectric layers; wherein
said plurality of electrodes and said plurality of piezoelectric layers are alternately laminated;
said plurality of piezoelectric layers are polarized in a thickness direction;
and
said plurality of electrodes and said plurality of piezoelectric layers are configured to vibrate in an area flexural mode.

15. The filter according to claim 14, wherein the filter comprises a three-terminal filter.